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<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	09/912,167	
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	First Named Inventor	Susan Ciaburro	
	Art Unit	2684	
	Examiner Name	John J. Lee	
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PATENT  
YR1-30

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF APPEALS**

Appeal No. \_\_\_\_\_

In re Application of: SUSAN CIABURRO ET AL

Serial No.: 09/912,167

Filed: July 23, 2001

For: METHODS FOR TESTING MULTIBEAM SATELLITE SYSTEMS USING INPUT  
POWER TELEMETRY AND OUTPUT NOISE POWER

**APPELLANTS' REPLY BRIEF**

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF APPEALS**

In re Application of: SUSAN CIABURRO ET AL	: Date: January 25, 2007
Serial No.: 09/912,167	: Group Art Unit: 2684
Filed: July 23, 2001	: Examiner: John J. Lee
For: METHODS FOR TESTING MULTIBEAM	:
SATELLITE SYSTEMS USING INPUT POWER	:
TELEMETRY AND OUTPUT NOISE POWER	:

**APPELLANTS' REPLY BRIEF**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This Reply Brief is in response to the Examiner's Answer of December 18, 2006. This brief is submitted in accordance with the provisions of 37 C.F.R. §41.41.

**ARGUMENT**

In response to Appellants' argument that there is no suggestion to combine the references, the Examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, citing *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the Examiner states that the reference Norin et al U. S. Patent No. 6,157,817 teaches in-orbit multiple receive antenna pattern testing with telemetry circuitry onboard the satellite measures the power level of the uplink signal received and converts it to a corresponding digital value and then Norin further improves teaching by U. S. Patent No. 6,233,433 that teaches downlink antenna pattern which transmits from the satellite. Therefore, according to the Examiner, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Norin '817 as taught by Norin '433, provide the motivation to improve reducing the in-orbit testing time and cost in satellite communication system.

Respondents respectfully disagree since there is no suggestion or motivation for one of ordinary skill in the art to combine Norin '817, directed to a method for in-orbit multiple receive antenna pattern testing, with Norin '433, directed to an apparatus and method of testing multibeam satellite repeater in orbit from a single ground station using a sampling and combining matrix, aside from one common inventor in each of the references and Respondents' own disclosure which inter alia requires transmitting downlink telemetry from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station which is deficient and conspicuously absent in Norin '817 and not cured by Norin '433.

Respondents respectfully state in support of this position that the passages relied upon by the Examiner at col. 1 and cols. 4 and 5 recited "a test signal is transmitted from ground station 2, amplified, and rebroadcast in downlink beams (8a-8d), which are sampled within their respective areas of coverage (10a-10d)." do not teach, suggest or imply transmitting the downlink telemetry from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station as required by element 4 of claim 1 and the same is the case with regard to Norin '433 at col. 1, lines 50-55 relating to ground test stations that are portable conducting power tests where the power level of the downlink signal is at or near maximum.

Regarding claim 1, the Examiner states that Appellants argue that the combination of Norin '817 and Norin '433 do not teach the claimed invention "slewing the satellite over orientation angles using a slow constant attitude translation". The Examiner respectfully disagrees with Appellants' assertion that Norin '817 and Norin '433 do not teach the claimed invention. The Examiner states contrary to Appellants' assertion, the Examiner is of the opinion that Norin '817 teaches the satellite position is slewed over angles (orientation angles) which encompass the area of reception of receive antenna and slewing is accomplished by incrementally adjusting (constant attitude translation) the satellite roll and orientation, more specifically, the satellite's position is slewed over angles approximately covering the receive antenna areas of reception based on satellite orientation information, as the telemetry stream containing updated information is continuously transmitted, and also the telemetry antenna receives commands from ground station so that normal (slowly slewing) operation as the satellite is slewed (see Fig. 2, abstract, and col. 4, line 5 to col. 5, line 12), regarding the claimed invention.

Also, the Examiner disputes Appellants' position that the claimed limitation "sensing a power level of the test signal on-board the satellite during slewing" does not teach by Norin '817. The Examiner respectfully disagrees with Appellants' assertion

and is of the opinion that Norin '817 teaches telemetry circuitry onboard the satellite senses the power levels of the signals and keeps track of the onboard equipment as the satellite's position is slewed over angles approximately covering the receive antenna areas of reception based on satellite orientation information, more specifically, telemetry circuitry converts the sensed uplink signal power levels to digital code for transmission in the telemetry data stream (signal on-board) returned to the ground test station during slewing, directing Respondents' attention to col. 6, lines 17-32, Fig. 1, 7, and col. 4, line 5 to col. 5, line 12 regarding the claimed limitation.

In addition, the Examiner disagrees that Norin does not teach the claimed limitation "processing the sensed power level and said orientation angles to verify the operation of said receive antenna on the satellite". The Examiner is of the opinion that Norin '817 teaches the satellite antenna configured and processed to perform sensed power levels and orientation angles (slewing angles) for testing procedure (citing col. 4, line 25 to col. 5, line 12 and Fig. 1, 2) regarding the claimed limitation.

Finally, the Examiner states that the combination of Norin '817 and Norin '433 does teach the claimed invention "transmitting downlink telemetry comprising sensed power level and orientation angles of the satellite from the satellite to a telemetry and command earth station". Consequently, the Examiner respectfully disagrees with Appellants' assertion and is of the opinion that Norin '817 teaches transmitting downlink telemetry data stream by telemetry circuit in the satellite for sensing the power level of received test signal and converts it to a digital code and slewing orientation angle as the satellite is slewed and communicating with command earth station, more specifically, the satellite transmits downlink telemetry data stream which includes such information as satellite orientation, temperature, signal power (power levels), status, and other data (see col. 4, line 25 to col. 5, line 12 and Fig. 1, 2). The Examiner goes on to state that Norin '433 teaches a test signal is transmitted from ground station (command earth station) and rebroadcast in downlink beams which are sampled to four test stations within their respective areas of coverage, more specifically, Fig. 1 teaches a satellite receives the telemetry stream from the earth command station and transmits the telemetry stream to test earth stations that the command earth station is located at a geographically separate location from the test stations (see Fig. 1, 4, col. 1, lines 44-57, and col. 5, lines 1-10), it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433, provide the motivation to achieve reducing the in-orbit testing time and cost in satellite communication system.

Respondents respectfully submit that in the passages relied upon by the Examiner, Fig. 1, abstract and col. 4, line 5 to col. 5, line 12, there is a broad-ranging

discussion relating to sensing the power levels of signals and keeping track of the onboard equipment in addition to specifically at col. 4, line 65 et seq “While the uplink test signal 3 is being received, the satellite position is slewed in step 72 over angles which encompass the area of reception of receive antenna 4. Slewing is accomplished by incrementally adjusting the satellite roll (elevation) and pitch (azimuth) orientation...Slewing an in-orbit satellite’s position to validate the contour of a shaped antenna is described in Egly et al, ‘In-Orbit Test of the First Hughes United States Direct Broadcast Satellite’...” all of which does not cure the deficiencies as recited above with regard to the manner in which the method of the instant claims outlines slewing, sensing power levels, transmitting downlink telemetry and processing the sensed power level to verify the operation of the receive antenna on the satellite as required by claim 1.

Respondents respectfully submit that at col. 6, lines 17-32 and Fig. 1, 7, there is merely a discussion of the power level of the respective received uplink signals, wherein the telemetry circuitry converts the sensed uplink signal power levels to a digital code for transmission in the telemetry data stream. Respondents respectfully submit that there is no teaching, suggestion or implication of the limitation “sensing a power level of the test signal on-board the satellite during slewing”. Respondents respectfully submit that this is also true of col. 4, line 5 to col. 5, line 12 previously discussed above.

Respondents respectfully submit that the limitation “processing the sensed power level and said orientation angles to verify the operation of said receive antenna on the satellite” is not taught, suggested or implied at col. 4, line 25 to col. 5, line 12 and Fig. 1, 2, previously discussed.

Respondents respectfully submit that the limitation “transmitting downlink telemetry comprising sensed power level and orientation angles of the satellite from the satellite to a telemetry and command earth station” is no where taught, suggested or implied in the recited passages relied upon by the Examiner at col. 4, line 25 to col. 5, line 12 and Fig. 1, 2, previously discussed above and specifically recited in the Brief. Furthermore, Respondents respectfully submit that in Fig. 1, 4, col. 1, lines 44-57, and col. 5, lines 1-10 there is no teaching, suggestion or implication with regard to the limitation at element 4 of claim 1 “transmitting downlink telemetry comprising sensed power level and orientation angles of the satellite from the satellite to a telemetry and command earth station that is located at a geographically separate location from the payload test earth station”.

Respondents therefore accordingly disagree with the Examiner that it would have been obvious for one of ordinary skill in the art at the time the invention was

made to modify the Norin '817 system as taught by Norin '433, provides the motivation to achieve reducing the in-orbit testing time and cost in satellite communication system as contended by the Examiner.

Regarding claim 2, the Examiner takes issue with Respondents that the combination of Norin '817 and Norin '433 does not teach the claimed invention "processing the noise power level and orientation angles to verify operation of the transmit antenna on the satellite".

Respondents respectfully submit that the limitation "processing the noise power level and orientation angles to verify operation of the transmit antenna on the satellite" as required by element 4 of claim 2 is nowhere to be found in col. 4, line 25 to col. 5, line 12, Fig. 1, 2, and col. 3, line 47 to col. 4, line 4, as contended by the Examiner in Norin '817. Respondents respectfully submit that the Examiner has been unable to identify in this broad-ranging discussion from col. 4 to col. 5 and col. 3 to col. 4 where the noise power level and orientation angles are processed to verify operation of the transmit antenna on the satellite as required by the claim. Respondents respectfully conclude that nothing in these passages relied upon by the Examiner relates to this element of the claim. Respondents respectfully submit that this is likewise not taught, suggested or implied in col. 2, line 64 to col. 3, line 35 and in Fig. 2, 3, wherein the Examiner contends that there is taught using a switching matrix which he concludes processes the noise power for operation of the transmit antenna so as to reduce the added unwanted noise to the combined signal and providing a method of testing individual channels.

Again, Respondents respectfully submit that nothing in col. 4, line 25 to col. 5, line 12 and Fig. 1, 2 teaches element 3 of claim 2 "measuring downlink noise in a small bandwidth at the telemetry and command earth station while the satellite is translated". Respondents respectfully submit that the Examiner is unable to specify wherein in this broad-ranging discussion the limitation is taught, suggested or implied as previously set out in Appellants' Brief.

Respondents respectfully do not see a correlation of the Examiner's contention that Norin '433 teaches the ground station measures the receive signal and a test station computer to record data corresponding to the downlink signals including information relating to signal that measuring power levels and interference or noise power levels and bandwidth information within recorded information in each downlink band during satellite is processing to measuring and processing as defined in elements 3 and 4 of claim 2. Furthermore, Respondents respectfully submit that col. 3, lines 10-58, Fig. 3, 4, and col. 4, line 14 to col. 5, line 23 of Norin '433 wherein the Examiner alleges received downlink signal is measured and recorded the signal

information, power level within each downlink band, for reducing possibility of adding unwanted noise, more specifically, the ground test antenna is measured by test equipment such as an analyzer (frequency), frequency counter, delay analyzer (quality measurement), power meter (signal strength measurement, noise measurement within signal transmission rate), or other measurement device, and information relating to the signal is recorded by the test station computer for later processing (translating) cures the deficiency of the instant rejection. Therefore, Respondents respectfully disagree that it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433, the motivation to do so being to achieve reducing unwanted noise by performing in-orbit satellite tests in satellite communication system, as contended by the Examiner.

The Examiner states regarding claims 3 and 4, Appellants argue that the combination of Norin '817 and Norin '433 does not teach the claimed invention "the uplink commands cause a slow constant attitude translation (claim 3) and a discrete steps in attitude translation of the satellite (claim 4)". The Examiner respectfully disagrees with Appellants' assertion and states that he is of the opinion that Norin '817 teaches during the test, the commands are transmitted from the ground test station to the satellite, directing it to adjust its orientation and normal operation, such that constant translation power level (discrete steps) to digital code, more specifically, the telemetry stream containing updated information is continuously transmitted, and also the telemetry antenna receives commands from ground station so that normal (slewing slowly) operation as the satellite is slewed (citing col. 4, line 5 to col. 5, line 12 and Fig. 1, 3), regarding the claim limitation.

Respondents respectfully contend that claim 3 is patentably distinguishable over Norin '817 for the reasons recited above and in the Brief with regard to claim 2, and further that the limitation as set out in claim 3 requiring that uplinked commands cause a slow constant attitude translation of the satellite is nowhere to be found in col. 4, line 5 to col. 5, line 12 and Fig. 1, 3.

The same applies as well to claim 4 with regard to being patentably distinguishable over Norin '817 with the further limitation requiring that the "uplinked commands cause a discrete steps in attitude translation of the satellite."

Regarding claim 5, the Examiner contends that Appellants argue that the combination of Norin '817 and Norin '433 does not teach the claimed invention "uplinking signal at different frequencies of interest from the earth station to the satellite". The Examiner respectfully disagrees with Appellants' assertion and states that he is of the opinion that Norin '817 teaches the ground test station transmits to the satellite multiple uplink test signals with frequencies corresponding to the receive

antennas being tested and each channel responds to uplink signals of different respective frequencies in the satellite (citing col. 6, lines 5-40 and Fig. 5, 6), regarding the claimed invention. Also, the Examiner disagrees with the Appellants' argument that the limitation "generating an input chain frequency response curve for a multibeam satellite communication system" does not teach by combination of Norin '817 and Norin '433. However, according to the Examiner, the recitation has not been given patentable weight because the recitation occurs in the preamble. The Examiner states that a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone, citing *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). The Examiner disagrees with Appellants that processing the recorded signal strength telemetry and uplink frequency to produce the input power frequency response curve is absent in either of the Norin references but fails to specify where in these references this limitation is to be found. However, the Examiner respectfully disagrees with Appellants' assertion and is of the opinion that Norin '817 teaches the ground station stores the translated position and signal information from telemetry data stream for processing that computer plots the power levels (generating input) as a function of the satellite's position to produce a map (output) of the receive antenna pattern (citing col. 4, lines 25-64 and Fig. 1), where Respondents respectfully contend this teaching is not to be found.

Respondents respectfully contend that nothing in col. 6, lines 5-40 nor in Fig. 5, 6, or at col. 4, lines 25-64 and Fig. 1 teaches, suggests or implies any of the elements of claim 5 as combined and specifically do not so teach, suggest or imply "uplinking signals at different frequencies of interest from the earth station to the satellite" (element 2 of claim 5), "generating downlink telemetry on-board the satellite that corresponds to the signal strengths of respective signals at the different frequencies" (element 3 of claim 5), or "processing the recorded signal strength telemetry and uplink frequency to produce the input power frequency response curve" (element 6 of claim 5).

Regarding claims 6 and 8, the Examiner takes the position that he has already responded to the limitation at the claim 1.

Respondents respectfully conclude that, for reasons previously recited above and in the Brief with regard to claim 1, claims 6 and 8 have been shown to be patentably distinguishable over Norin '817 or Norin '433, alone or in any combination.

Regarding claim 7, the Examiner takes the position that he has already responded to the limitation at the claims 2 and 5.

Respondents likewise respectfully submit that claims 2 and 5 have been shown to be patentably distinguishable over the Norin references for reasons recited above and, more specifically, set out in the Brief.

Regarding claim 9, the Examiner contends that Appellants argue that the combination of Norin '817 and Norin '433 does not teach the claimed invention "measuring noise power of the downlink beam over a small bandwidth centered around a plurality of selected frequency of interest at the earth station" (element 3 of claim 9). The Examiner respectfully disagrees with Appellants' assertion and is of the opinion that Norin '433 teaches received downlink signal, that switched for electing the sampled signals to be combined to produce a single combined signal/beam, is measured and recorded the signal information, power level within each downlink band, for reducing possibility of adding unwanted noise, more specifically, the ground test antenna is measured and switched for selecting the frequencies to be combined to produce a single combined signal/beam by test equipment such as an analyzer (frequency), frequency counter, delay analyzer (quality measurement), power meter (signal strength measurement, noise measurement within signal transmission rate), or other measurement device, and information relating to the signal is recorded by the test station computer for later processing (translating) (citing col. 4, line 14 to col. 5, line 23, abstract, and Fig. 3, 4). The Examiner concludes it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the Norin '817 system as taught by Norin '433, the motivation to do so being to achieve reducing unwanted noise by performing in-orbit satellite tests in satellite communication system.

Respondents respectfully contend that nothing in col. 4, line 14 to col. 5, line 23, or in the abstract, or Fig. 3, 4 of Norin '433 teaches, suggests or implies "measuring the noise power of the downlink signal over a small bandwidth centered around a plurality of selected frequency of interest at the earth station" (element 2 of claim 9), so as to process the noise power measurements to generate the output chain frequency response curve (element 3 of claim 9). Respondents respectfully point out that there is no teaching of outputting a chain frequency response curve in any of the recited passages relied upon by the Examiner with respect to claim 9.

Furthermore, Respondents respectfully disagree with the Examiner that one of ordinary skill in the art at the time the invention was made would modify the Norin '817 system as taught by Norin '433, the motivation being to achieve reducing unwanted noise by performing in-orbit satellite tests in satellite communication system.

Regarding claim 10, the Examiner states in response to Appellants' arguments, the recitation "generating a gain measurement of a transponder of a multibeam satellite communication system" has not been given patentable weight because the recitation occurs in the preamble. The Examiner states a preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone, citing *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). Also, according to the Examiner, Appellants are incorrect that the limitation "processing the recorded noise power measurements to generate a gain measurement of the transponder" is absent in Norin '817 which, according to the Examiner, teaches a computer stores the translated position and signal information (power levels, noise level) that including power level measurement and interference power measurement from the telemetry data stream and then processing and generating gain measurement of the satellite by an amplifier to increase the power of signal for transmission, more specifically, the computer plots the power levels with noise power of received downlink signals as a function of the satellite's position to produce a map (gain measurement) of receive antenna pattern (see col. 3, line 47 to col. 4, line 64 and Fig. 1, 3f), regarding the claimed limitation.

Respondents respectfully submit that nothing in col. 3, line 47 to col. 4, line 64 and Fig. 1, 3f teaches, suggests or implies "measuring noise power of the downlink beam over a small bandwidth at a selected frequency at the earth station" and "processing the recorded noise power measurements to generate a gain measurement of the transponder" as required by elements 2 and 3 of claim 10, respectively.

Regarding claim 11, the Examiner takes the position that he has responded to the limitation at claims 2 and 9.

Respondents accordingly respectfully submit that claims 2 and 9 have been shown to be patentably distinguishable over both Norin references for the reasons recited above and those more specifically set out in the Brief.

Respondents respectfully submit that, for the reasons recited above and those more specifically set out in the Brief, all of the claims on appeal have been shown to contain patentable subject matter and to be patentably distinguishable over the art of record, Norin '817 and Norin '433, alone or in any combination.

Accordingly, Respondents respectfully request that the final rejection of the primary Examiner be reversed and that this application be allowed to go to issue.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "AW Karambelas". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

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